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PLAN OF WORK
MUSKINGUM RIVER BASIN
OHIO

July 1967

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INTRODUCTION

The United States Department of Agriculture is participating in this survey under the authority contained in Section 6 of Public Law 566, as amended. This will be a coordinated detailed (Type IV) study. The work will be carried out within the United States Department of Agriculture in accordance with the Memorandum of Understanding, dated February 2, 1956, between the Soil Conservation Service, Forest Service, and the Economic Research Service.

The Corps of Engineers has been directed by a Senate resolution adopted June 3, 1964, to review the report of the Chief of Engineers on the Ohio River, published as House Document numbered 306, Seventy-fourth Congress, First Session, and other pertinent reports, "... with a view to determining whether any modifications of the recommendations contained therein are advisable at this time, with particular reference to developing a comprehensive plan for water and related land resources in the Muskingum River Basin, including consideration of present operating plans for existing reservoir projects in that basin."

The study will consider all phases of the basin's water and related land resources development including navigation, flood control, water quality control, water supply, recreation, irrigation, drainage, land management, and fish and wildlife enhancement. Consideration will be given to a variety of improvements, including, but not limited to: modification of existing projects to meet present and future needs for water resources development; new multiple purpose reservoirs to augment the existing system and for presently unprotected areas; levees, and channel improvements for local protection; and systems of small headwater dams for upstream watershed protection. Nonstructural measures such as flood plain management, and land management and cover programs will be considered to insure that the plan of development will afford the optimum utilization of the basin's water and related land resources. The Corps of Engineers has invited the Bureau of Outdoor Recreation, the Bureau of Sport Fisheries and Wildlife, the U. S. Geological Survey, and Federal Water Pollution Control Administration of the Department of the Interior, the Soil Conservation Service, Economic Research Service, and Forest Service of the Department of Agriculture, and the Ohio Department of Natural Resources, Health and Development and the Muskingum Watershed Conservancy District to actively participate in the study.

DESCRIPTION OF BASIN

Physical

The Muskingum River Basin extends from the Cities of Ashland and Akron in northeastern Ohio, south to the confluence of the Muskingum and Ohio Rivers at Marietta. It has a maximum length of about 150 miles and a maximum width of about 120 miles. The total area of the basin is approximately 8,040 square miles. It includes all of Wayne, Holmes, Coshocton, Guernsey, Muskingum, and Tuscarawas Counties and portions of Richland, Ashland, Medina, Summit, Columbiana, Stark, Carroll, Harrison, Belmont, Monroe, Noble, Washington, Morgan, Perry, Fairfield, Licking, Knox, and Morrow Counties. (See Attachment No. 1 for Map of the Basin.)

Economics

The study area had a population of 1,670,787 persons in 1960, with the largest population concentrations occurring in Richland, Stark and Summit Counties. These counties, in addition to others which encompass Standard Metropolitan Statistical Areas, have shown a steady population increase since 1930. Some of the other so-called rural counties in the basin have experienced reductions in population during the same period.

In 1960, approximately 40% of the labor force of about 600,000 was employed in manufacturing. No other sector of the economy employed half as many workers. In the same period, the wholesale and retail trade and personal and business services sector each employed approximately 17% of the labor force. About 4½% of the labor force was employed in agriculture, forestry, and fisheries in 1960.

In 1962, more than 50% of the private wage and salary disbursements to workers in the basin came from manufacturing industries. This figure has increased steadily in the last 30 years. Private wages to farm workers and farm proprietor incomes have declined steadily during the same period.

The natural resources of the basin consist of land, water, coal, clay, oil, gas, timber, wildlife and scenic beauty. In some cases, the water and land resources have been inadequately developed or poorly utilized. Frequently, poor water quality, erratic water supplies, and undeveloped water and land resources have hampered economic growth. With proper management, water supplies are adequate to meet the needs of the basin.

STATUS OF WATER AND RELATED LAND RESOURCE PROGRAMS

There are many "going" water and related land resource programs in the basin. The status of the major programs are as follows:

Soil and Water Conservation District Program

There are 24 local Soil and Water Conservation Districts covering the entire drainage of the basin. The Districts are organized under state law and are

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managed by local people. The local initiative and responsibility for the vast majority of the conservation program now on the land are the direct result of the formation and operation of the Districts. Technical service to landowners and operators for planning and applying conservation measures is furnished through the Districts by the Soil Conservation Service and other federal and state conservation agencies.

Soil and Water Conservation Research

The Agricultural Research Service conducts soil and water conservation research at its station located at Coshocton, Ohio. Studies of factors affecting rates and amounts of runoff will help predict stream flow and water yield from small ungaged agricultural watersheds.

The U. S. Forest Service has a number of watershed management studies within the basin. The most important of these are conducted on the Dover Experimental Area by the "Management of Storm Runoff" project headquartered in Columbus. This project seeks methods for reducing storm runoff from the forested watersheds of the Allegheny-Cumberland Plateau. A strip-mined area restoration project, concerned primarily with effects on water, also has some experimental areas within the basin.

Muskingum Watershed Conservancy District

The Muskingum Watershed Conservancy District organized in June 1933, covers all, or portions, of 18 of 24 counties included in the drainage area of the basin. The Conservancy District has been a sponsor of all PL 566 projects in the basin to date and has cooperated with the local Soil and Water Conservation Districts to carry out the conservation program. The Conservancy District in cooperation with the Corps of Engineers has developed 14 flood control reservoirs, 10 of which provide permanent lakes with a total surface area of 16,030 acres. In addition to the permanent pools, a storage capacity totaling 1,327,800 acre-feet is provided in the system for the temporary storage of flood flows. The Bolivar, Mohawk, Dover, and Mohicanville reservoirs are operated as dry dams. The 14 reservoirs are operated as units of a coordinated reservoir system for flood protection. The Muskingum Watershed Conservancy District has developed and is continuing development of the reservoir areas and adjacent land areas of 51,000 acres for recreational activities and beneficial uses of agricultural lands, forests, and fish and wildlife resources. District land holdings approximate 52,000 acres.

The Chippewa and Buffalo Sub-districts of the Muskingum Watershed Conservancy District have been organized. Watershed work plans have been prepared and approved for construction in each of these Sub-districts under the provisions of PL 566.

Wayne National Forest

The Wayne National Forest extends into the basin in Perry County. The area within the proclamation boundary in the basin amounts to 45,500 acres, of which only 305 acres are in Federal ownership.

Watershed Protection and Flood Prevention Act (PL 566)

Interest and activity are high in the Small Watershed Program throughout the basin. A total of 11 applications have been received for assistance under this program. These applications cover about 851,290 acres. Soil and Water Conservation Districts, County Commissioners, and the Muskingum Watershed Conservancy District are sponsors, along with other local organizations.

Preliminary Investigations for PL-566 watersheds have been started on South Fork Licking River, Log Pond Run, Big Run, Beaverdam, and Black Fork-Marsh Run II.

There are two PL-566 watersheds approved for operations in the basin. They are the Chippewa Creek Watershed which includes 120,320 acres in Wayne and Medina Counties, and the Buffalo Creek Watershed which includes 32,150 acres in Noble County.

Watershed investigations on three other watersheds--Wolf, Moxhala-Jonathan, and Wakatomika Creeks--are being carried out through the Water Resource Survey for Appalachia under Section 206 of PL 89-4.

Ohio Department of Natural Resources

The State of Ohio Department of Natural Resources is deeply involved in the water and related land resources of the Muskingum Basin through its various divisions. The Division of Water, Division of Lands and Soil, Division of Parks, Division of Recreation and Wildlife, Division of Forestry and Reclamation, and the Ohio Water Commission all have active programs in the basin.

The Department of Natural Resources will play an increasingly important role in recreation development in the basin. Activities now include operation of 22 areas in the basin which include State Parks and Forests, Canal lands, Wildlife areas, and the Muskingum River Lock and Dam System.

Important recreation facilities to be provided in the near future are those planned for the Salt Fork Reservoir area near Cambridge, Ohio.

The reservoir will have 74 miles of shore line and 3,000 acres of permanent pool.

Recreation facilities at the Dillon Reservoir project is operated and maintained by the Ohio Department of Natural Resources.

U. S. Army Corps of Engineers

A comprehensive review of Muskingum Basin water resources needs, authorized by Senate Resolution adopted June 3, 1964, is now being conducted by the Corps of Engineers. This study which is scheduled for completion in 1970 is the first basin-wide comprehensive review conducted by the Corps since construction of the basin system of flood control

THE HISTORY OF THE UNITED STATES OF AMERICA

The first part of the history of the United States of America is the period from the discovery of the continent by Christopher Columbus in 1492 to the establishment of the first permanent settlements. This period is characterized by the exploration of the continent by Spanish, French, and English explorers, and the establishment of the first permanent settlements by the English in 1607.

The second part of the history of the United States of America is the period from the establishment of the first permanent settlements to the American Revolution in 1776. This period is characterized by the growth of the colonies, the struggle for independence, and the establishment of the United States as a new nation.

The third part of the history of the United States of America is the period from the American Revolution to the Civil War in 1861. This period is characterized by the expansion of the United States, the struggle for slavery, and the establishment of the United States as a powerful nation.

The fourth part of the history of the United States of America is the period from the Civil War to the present. This period is characterized by the reconstruction of the South, the growth of the United States, and the establishment of the United States as a world power.

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reservoirs. This study will give emphasis to the phases of water management other than flood control such as water supply, pollution control by augmentation of stream flow, and recreation.

In addition to the 14 reservoir projects installed and operated in cooperation with the Muskingum Watershed Conservancy District, the multiple-purpose Dillon reservoir project has been constructed on the Licking River. This reservoir has a surface area of 1,330 acres and provides a maximum capacity of 260,900 acre-feet of flood storage. Local protection projects at Massillon, Roseville, Newark, and Mount Vernon have also been constructed. A local protection project is authorized for Zanesville, a reservoir project on the North Branch of Kokosing River is in the advanced planning stages, reservoirs are authorized on Wakatomika and Killbuck Creeks, and a snagging and clearing project has been completed at Canton on Nimishillen Creek. A flood plain information study has been completed at Canton, Ohio, and another is being initiated on Tuscarawas River in Stark County.

Agricultural Extension Service

The Agricultural Extension Service provides educational and organizational assistance to groups and individuals for planning and implementing resource development programs. It provides scientific information and advice for farm improvement, livestock and crop production and farm management. It offers training and information to recreation leaders and assists in evaluation of proposed recreation projects. Its expanding efforts in resource development are expected to have great impact in all areas of the basin.

Farmers Home Administration

Farmers Home Administration provides advances and loan funds for a local organization to plan and to execute works of improvement for the protection and the development of land and water resources in a small watershed under the Watershed Protection and Flood Protection Act (Public Law 566). Loans could be made available for Resource Conservation and Development Projects. Grant funds are available for counties or regions to prepare comprehensive sewer and water planning. Rural communities and areas that need assistance to provide water and sewer facilities can be helped with loan and grant funds. Individual loans also can be provided to operate or to purchase farms and rural housing.

Federal Water Pollution Control Administration

The objectives of the Federal Water Pollution Control Administration of the U. S. Department of the Interior are to enhance the quality and value of the Nation's water resources and to prevent, control, and abate water pollution through cooperative local, state, and federal pollution control programs. The Federal Water Pollution Control Act directs the Secretary of the Department of the Interior to prepare or develop comprehensive programs to accomplish these objectives. In addition, an important responsibility assigned by law to this agency is the furnishing of information and recommendations to Federal

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construction agencies as to needs for reservoir storage for regulation of streamflow for the purpose of water quality control. In compliance with this Act, the Ohio River Basin Project was established in the fall of 1962 with the organization of a Project Headquarters in Cincinnati, Ohio, followed by the establishment in 1963 of field stations in Wheeling, West Virginia, and Evansville, Indiana. Comprehensive investigations in the Muskingum River basin were initiated in 1966.

Cooperative State and Private Forestry Programs

The Ohio Division of Forestry and Reclamation, in cooperation with the U. S. Forest Service, conducts programs in the fields of watershed and forest management, fire prevention and control, and insect and disease control on State and privately-owned forest lands in the basin.

Agricultural Conservation Program and Cropland Adjustment Program

These programs provide Federal cost-sharing for certain conservation measures and adjustment payments for cropland diversion. Soil conservation practices applied under these programs improve the quality of water through reduction of soil erosion and sedimentation. They also reduce or slow surface runoff and provide water storage for agricultural, recreation and other rural uses. The Cropland Adjustment Program helps farmers divert cropland to protective conservation uses under long-term agreements. Extra incentives are offered farmers who wish to provide free public access for hunting, fishing, hiking and trapping. Both of these programs contribute to the establishment of grass and tree cover on sloping cropland, thus reducing erosion and slowing surface runoff.

Resource Conservation and Development Project

Local sponsors have submitted an application for an RC&D Project under the Food and Agricultural Act of 1962, which includes Belmont, Monroe, Noble, Washington, and Morgan Counties. Part of the area covered by this project will be in the drainage area of the Muskingum Basin. The sponsors of this project are the Soil and Water Conservation Districts and County Commissioners of the five counties and the Muskingum Watershed Conservancy District.

Comprehensive River Basin Planning

Coordinated Comprehensive Framework Surveys, Type 1, for the Ohio River Basin will be completed in 1967, which includes the Muskingum Basin. Information and data compiled as a result of this and other studies by the U. S. Department of Agriculture and other participating agencies will be utilized to the fullest in carrying out the Type IV Study.

1. ADDITIONAL INFORMATION

The following information is provided for the purpose of identifying the source of the information and the nature of the information. The information is provided for the purpose of identifying the source of the information and the nature of the information. The information is provided for the purpose of identifying the source of the information and the nature of the information.

1. The first part of the document is a letter from the President of the United States to the President of the Senate, dated January 1, 1901. The letter is signed by William McKinley and is addressed to John D. Long. The letter is a copy of a letter that was sent to the President of the Senate by the President of the United States. The letter is a copy of a letter that was sent to the President of the Senate by the President of the United States.

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Journal of Interpersonal Violence 26(10)br/>© The Author(s) 2011
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PROBLEMS AND NEEDS

Some of the major problems and needs within the basin directly associated with water and related land resources are:

1. Water Supply - There is a shortage of water developed for municipal and industrial use in several communities in the basin. Without proper management, water supplies will become critical in many other areas throughout the basin by the year 2000, due to the probable future growth of population and industry.
2. Flood Prevention - Although many of the major flood hazards in the Muskingum Basin have been eliminated by the existing reservoir system and by local protection works, a number of serious problems still exist. Flood damages in 1959 were the greatest on record in the basin, amounting to about 23 million dollars. Much of the remaining damage potential exists in the basin areas upstream from the reservoir system. The remaining problems are both rural and urban. Major croplands located in and along the many narrow valleys are subject to severe flooding. The Ohio River Basin Comprehensive Survey Appendix F shows there is an average annual flood damage of crop and pasture land of \$1,469,000.
3. Erosion and Sediment - The erosion and resulting sedimentation problem is moderate to severe in many areas of the basin. Severe erosion is prevalent in watersheds with extensive surface strip-mine areas, such as the Moxahala Creek Watershed in Muskingum County and Egypt Valley in Belmont County. Stream-bank erosion occurs along several reaches of the main stem and on channels on many of the small watershed tributaries. The Ohio River Basin Comprehensive Survey Appendix F shows there is an average annual damage of \$29,000.
4. Irrigation - Although water for irrigation is not in heavy demand at present, (2,600 acres of specialized crops) some additional need for water for irrigation is expected to develop in the basin proper. By the year 2020, over 35,000 acres is estimated to be irrigated. Ground water supplies in small to moderate amounts are available in some areas of the basin.
5. Drainage - Drainage problems exist in varying degrees throughout the basin. Both tile and open ditch drainage are needed in many areas for the maximum production of agricultural products. Increased demand for agricultural products may require that the wet soils be drained. There are presently 306,000 acres drained. By year 2020, it is estimated that 543,000 acres will be drained.
6. Recreation - Excellent recreational facilities are provided by the lake developed by the Muskingum Watershed Conservancy District. The 10 lakes have a surface area of 16,030 acres. The Dillon reservoir provides an additional 1,330 acres and the

1. The purpose of this document is to provide a comprehensive overview of the current state of the project and to identify the key areas for improvement.

2. The project has been initiated to address the growing need for a more efficient and secure communication system. The initial phase of the project has focused on identifying the requirements and developing a detailed plan.

3. The project has been divided into several key areas of focus, including system architecture, software development, and testing. The system architecture has been designed to be scalable and secure, while the software development phase has focused on implementing the core functionality.

4. The project has been progressing well, with the majority of the core functionality now implemented. The testing phase is currently underway, and the results have been promising. The project is expected to be completed by the end of the year.

5. The project has been a success, and the new communication system is now in place. The system has been tested thoroughly and is ready for deployment. The project has been a significant achievement for the organization.

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Salt Fork reservoir, now under construction, will provide about 3,000 acres of water for recreation and fish and wildlife purposes. The basin presently has about 740 bodies of water of two acres or more. Although notable progress has been made in developing water-related recreational facilities, the pressure for additional facilities continues. The Muskingum Watershed Conservancy District is working on a land-use and recreation-development plan covering the next 20 years. New facilities will have to be added and existing facilities will have to be expanded in the next 5 to 10 years to meet the growing demand. In 1937, the Ohio Conservancy District Act was amended to permit recreation as a purpose. Studies were initiated by the Muskingum Watershed Conservancy District and a "General Plan for Parks and Recreation" was adopted on November 13, 1946. This plan is being revised and updated in accordance with the "State-wide Plan for Outdoor Recreation in Ohio."

7. Fish and Wildlife - A considerable portion of the basin is subjected to heavy hunting and fishing pressure. The problem of providing additional water and land to meet this growing need is an important aspect of the over-all development of the basin.
8. Pollution - Waste materials from various sources are degrading water quality and increasing the cost of treatment for human and industrial uses. Erosion and acid-mine drainage is severe in several of the upstream watersheds.
9. Land and Related Resource Management - There is a need for more intensive management of present open and forested land to improve hydrologic conditions and to contribute to the over-all economic development of the basin. In recent years, large acreages in the unglaciated uplands have reverted from cropland to low-grade pastures and forests. Sizeable acreages have been strip-mined and must be reclaimed before they become useful once more. The glaciated portion of the basin, being better adapted to cultivation, has had a more stable agricultural economy. But even in much of this area, there is need to develop the soil, water and other resources more completely. Changes in land use are needed. Cultivated lands which are severely eroded, too steep for cultivation, or subject to frequent overflow and not feasible to correct should be converted to managed pasture or forest use.
10. Urban Fringe Land Transition - With rapid transition of rural areas into suburban development, the quality of the natural environment is threatened. Permissive construction of unsightly residential, commercial, and industrial facilities, which can also accelerate problems of air and water pollution, indicate the need for careful area and land-use planning. Additional problems are encountered on or adjacent to construction areas where soils are more openly exposed to erosion.

OBJECTIVES, SCOPE AND EXPECTED RESULTS

The over-all objective of the comprehensive survey of the water and related land resources of the Muskingum River Basin is to obtain sufficient information regarding the needs, uses, and possible development of the basin's resources to formulate a basin plan which coordinates the purposes of development between the sub-basins. The plan is expected to identify those projects which should be initiated within the next 10 to 15 years, and indicates the potentials for meeting future needs.

The objective of the United States Department of Agriculture's participation in the Basin Survey is to assist in the preparation of a comprehensive and coordinated plan for the orderly development of the Muskingum River Basin. This plan will be used by local, state, and federal agencies in Ohio in their specific planning and construction activities for the conservation, development, and utilization of water and related land resources.

The plan will include:

1. The appraisal of agricultural, rural, forest, and all other upstream watershed needs of the basin.
2. Priority recommendations for watershed development that will coordinate federal, state, and local interests in water and related land resources.
3. The identification of projects and measures which should be provided within the next 10 to 15 years.

MAJOR ELEMENTS OF THE SURVEY

The comprehensive survey of the water and related land resources will be divided into the following five major elements:

1. An inventory of present water and land resources. (Available from Type 1)
2. The determination of the over-all needs and management of the water and land resources. (Available from Type 1)
3. An evaluation of the basin's capabilities and potential for meeting the needs.
4. Intensify studies of specific projects which will need to be installed in the next 10 to 15 years.
5. The formulation of a plan for meeting the resource needs both now and in the foreseeable future.

The United States Department of Agriculture Agencies will carry out the following to the extent feasible:

A. Prepare Inventories

1. Inventory of present water and land resources, including such items as available land, land use, land conditions, land treatment installed, cover conditions, availability of water, water quality, existing recreational facilities, and the physical and economic factors influencing the use of these resources.
2. Inventory of present agricultural and urban floodwater, erosion, and sediment damages in upstream watersheds and on the main stem and major tributaries, as requested.
3. Inventory of water storage and water control opportunities in sub-watersheds, including physical data for each site, as potential development for (1) flood prevention, (2) water supply, (3) water quality improvement, (4) agricultural water management, (5) recreation, and (6) fish and wildlife habitat improvement.

B. Determine All Agricultural and Non-Agricultural Needs for Water and Land for Upstream Areas

1. Determine agricultural and rural needs for water and land resources as related to demands for agricultural products, taking into account projected advances in production and marketing technologies.
2. Obtain data pertaining to the needs for water and land for urban, industrial, recreational, and other non-agricultural uses, based on estimated urban and industrial expansion, from other agencies, who are specialists in those fields. This will include:
 - a. The estimated needs for municipal and industrial water supply and water quality control.
 - b. The quantity and quality of ground-water supplies in the basin.
 - c. The evaluation of the need for fish and wildlife habitat improvement.
 - d. The magnitude of the demand for the development of recreational facilities in the basin.
 - e. Other published or unpublished material pertinent to the development of the water and land resources of the basin.

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C. Evaluate Potentials of Land Treatment and Structural Measures to Meet the Needs for Agricultural Products and Other Rural Needs and Requirements.

1. Evaluate, in relation to the demands for agricultural products, the ability of the available land and water resources to meet production needs.
2. Determine the need for accelerating the installation of the land treatment practices on forest and open lands.
3. Based on appraisals of needs, select the most feasible system of structures, to meet the upstream needs for water supply, water quality control, flood prevention, drainage, irrigation, recreation, and fish and wildlife habitat improvement, as well as to contribute toward meeting the main stem needs.
4. By use of acceptable short-cut methods where applicable and based upon estimates and projections, determine the costs and benefits of the structural features in the plan and the allocation of costs to purposes.

D. Project Identification

Make watershed investigations on upstream watersheds to meet identified needs.

E. Develop the Plan and Report

1. Participate with other agencies interested in the survey in the formulation of a comprehensive plan for the entire basin, including the coordination of the upstream plan.
2. Prepare a report of the Department's findings and recommendations to support project authorization.

GENERAL PROCEDURES FOR THE SURVEY

The survey will be under the general guidance of an USDA Field Advisory Committee. This committee will maintain continuous close field working relationships among the Departmental Agencies and the Field Advisory Committee will collaborate with Soil and Water Conservation District Supervisors, Conservancy District Directors, County Commissioners, City and Village governing bodies, State and Federal Agencies, and other local organizations participating in the survey.

Considerable data has been compiled on the Muskingum River Basin as a result of the Ohio River Comprehensive Type I Framework Survey. This data will be analyzed and supplemented with additional detailed information for the Type IV Study.

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF THE HISTORY OF ARTS
CHICAGO, ILLINOIS

TO THE HONORABLE THE PRESIDENT OF THE UNIVERSITY OF CHICAGO
FROM THE DEPARTMENT OF THE HISTORY OF ARTS

THE DEPARTMENT OF THE HISTORY OF ARTS
HAS THE HONOR TO ACKNOWLEDGE THE RECEIPT OF YOUR LETTER OF THE 15TH INSTANT

IN WHICH YOU REQUESTED THAT THE DEPARTMENT OF THE HISTORY OF ARTS
SHOULD BE KEPT ADVISED OF THE PROGRESS OF THE WORK OF THE
COMMISSIONERS OF THE UNIVERSITY OF CHICAGO IN THE MATTER OF THE
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HISTORY OF ARTS.

YOURS VERY TRULY,
THE DEPARTMENT OF THE HISTORY OF ARTS

THE UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS

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In the Type IV Study, a watershed investigation report will be written on every sub-watershed in the basin which has a b:c ratio of .8 to 1 or greater. An inventory of structure sites and their suitability for water storage will be made in each watershed. Data from the Type I Studies will be supplemented by on-site map studies and field surveys.

The work outline will be developed jointly by members of the Field Advisory Committee. It will indicate the primary activities to be accomplished, dates scheduled, and the degree of responsibility of all assigned participating agencies.

The studies will be made in enough detail to identify those specific projects in the basin which will need to be started within the next 10 to 15 years. The nature, scope, and intensity of the studies of specific projects will be sufficient to provide a basis for project authorization.

USDA AGENCY RESPONSIBILITIES

Soil Conservation Service

The Soil Conservation Service has over-all responsibility for the survey and specific responsibility for:

1. Providing the chairman of the Field Advisory Committee.
2. Making physical appraisals of agricultural and rural water problems and resource development needs and defining them.
3. Determining the development potentials of upstream areas, including the physical and economic feasibility of watershed projects.
4. Evaluating the physical and economic effects of upstream projects and coordinating them with the proposals of other departments.
5. Determining treatment needs for non-federal open lands in the basin.

Forest Service

The Forest Service has the responsibility for:

1. Determining present and future cover conditions and treatment needs of all forest lands. It will collaborate with other federal land management agencies when their lands are involved.
2. Making the analysis of the forest resource sector of the economy.

3. Making investigations and analyses pertinent to use, treatment, development, and management of the Wayne National Forest to meet basin-wide needs for water and related land resource development.
4. Appraising the water needs of forest-based industries.
5. Determining impacts of proposals by other agencies on the Wayne National Forest and other forest lands.

Economic Research Service

The Economic Research Service is responsible for:

1. Making the economic base survey.
 - a. Analysis and projection of (1) economic activity in the agricultural and related sectors of the economy, (2) other economic activity in rural areas, and (3) the demand for land and water resources in such activities.
 - b. Analysis of the current and projected demands for goods and services obtainable from the use of water and related land resources and the translation of such demands into economic needs for development.
2. Making studies of problems and needs.
 - a. Analysis of agricultural and rural water problems as they relate to economic activity in rural areas, specifically to the volume and value of production, employment, and income.
 - b. Economic appraisal of agricultural and rural needs for water and related land resource development.
3. Appraisal of prospective economic impact of development alternatives defined by the survey on the agricultural, and related sectors of the economy and the economic relationship of these alternatives to the coordinated and comprehensive development of the basin.
4. Providing consultive services.

Provide consultation to the Soil Conservation Service and the Forest Service in developing and applying standards and procedures for assessing the economic feasibility of watershed developments.

ACTIVITIES OF COOPERATING ORGANIZATIONS

All local, state and federal agencies responsible for programs or activities that may be affected by or may affect the study effort will be kept informed on progress and findings. They will be requested to supply available data and program information that can contribute to the study. Major local, state and federal agency contribution and effort is expected to be as follows:

Local

Supervisors of Soil and Water Conservation Districts, Directors of the Muskingum Watershed Conservancy District, and members of the County Technical Action Panels will help identify the water and land resource problems and needs in the areas of their jurisdiction. They will provide information on the location and extent of the problems, the importance of the various problems on the local community level, and will keep landowners informed on the progress of the study.

District Supervisors will provide the leadership needed to determine local interest in proposed PL-566 watershed projects and in explaining benefits to be derived. They will provide information on problems of flooding to county roads and damages incurred. Their consultation and guidance will be sought concerning rights-of-way on roads that might be affected by water storage reservoirs and other structural measures. They will obtain permission to enter all lands for the purpose of making surveys.

State

It is anticipated the following State Agencies will supply data needed for the study:

- Ohio Department of Natural Resources
- Ohio Department of Agriculture
- Ohio Department of Development
- Ohio Department of Highways
- Ohio Department of Health
- Ohio Water Commission

Federal

There are several federal agencies now involved in the field of natural resources. The programs and data of all agencies will be reviewed for information that can be used in the Muskingum River Basin Survey. Plans will be coordinated with all federal agencies having an interest in the resources of the basin. USDA agencies will maintain close contacts with the Departments of: Interior; Army; Commerce; Health, Education, and Welfare.

ARRANGEMENTS FOR COORDINATION

The works of the Department will be coordinated with other agencies, including the Ohio Department of Natural Resources and the U. S. Army Corps of Engineers, and other local, state and federal agencies participating in the study. Raymond S. Brown, Chairman of the USDA Field Advisory Committee, will be the U. S. Department of Agriculture representative. Guidance will also be furnished by the USDA Washington Advisory Committee.

The work of the Economic Research Service, the Forest Service, and the Soil Conservation Service will be coordinated by the USDA Field Advisory Committee.

Work within the three agencies will be coordinated as follows:

Economic Research Service

In addition to participation in the activities of the Field Advisory Committee, the Economic Research Service will maintain coordination with other agencies throughout the development of the projective economic analysis of the basin. Major participation will be accomplished by staff personnel assigned to the North Central Resources Group at East Lansing, Michigan.

Forest Service

The Forest Service will headquarter a representative with the River Basin Survey Staff. He will work under the immediate direction of the Morgantown Field Office. He will work closely with the Survey Staff Leader and with the ERS representative to insure a common approach, to identify and resolve inter-agency problems at an early stage, to expedite exchange of needed information, to maintain schedules, and to develop aspects of the study requiring inter-agency teamwork. He will contact representatives of the State Forester's Office, BOR, F&WS, USGS, CE, and others as appropriate and will keep Survey Staff Leader informed of results of such contacts that are of interest to him.

Soil Conservation Service

The actual work of making Watershed investigations in the basin will be accomplished by personnel assigned to the River Basin Survey Staff by the State Conservationist. Coordination to insure uniformity, type, scope, and detail of information and data needed will be done by the River Basin Staff Leader. Frequent contacts will be made with all interested agencies, organizations, and groups by telephone, correspondence, and special meetings in order to maintain schedules and meet goals.

ADMINISTRATION OF THE SURVEY

Field Advisory Committee

The Department's part of the survey will be under the general guidance of an USDA Field Advisory Committee (FAC) which has been established to maintain close field working relations among the three Department agencies. The Field Advisory Committee is composed of Raymond S. Brown, Chairman, SCS; Robert R. Lindahl, Forest Service; and Roger W. Strohbehn, Economic Research Service.

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The Soil Conservation Service has been designated to provide over-all leadership for carrying out the U. S. Department of Agriculture responsibilities for River Basin Surveys.

The Field Advisory Committee will be responsible for:

1. Developing Departmental procedures.
2. Programming and coordinating Departmental field activities.
3. Arranging for necessary consultation with subject matter specialists.
4. Over-all field relationships with all agencies having an interest in the survey.
5. Assigning priorities and schedules.
6. Arranging for preparation and field review of survey findings and interim reports.
7. Preparation of the Departmental report.

Funding

The funding of the Department's participation in this survey for FY-1968 is shown. An addendum will be added at a later date indicating funding for FY-1969, FY-1970 and 1971.

| <u>Agency</u> | <u>FY-1968</u> | <u>FY-1969</u> | <u>FY-1970</u> | <u>FY-1971</u> |
|---------------------------|------------------|-------------------|-------------------|-------------------|
| Soil Conservation Service | <u>\$101,000</u> | <u> </u> | <u> </u> | <u> </u> |
| Economic Research Service | <u>18,000</u> | <u> </u> | <u> </u> | <u> </u> |
| Forest Service | <u>17,000</u> | <u> </u> | <u> </u> | <u> </u> |
| Total | \$136,000 | | | |

Staffing

The Survey Staff will consist of a River Basin Staff Leader, a hydrologist, an economist, an engineer, a geologist, and four engineering technicians, supplemented by WAE help and necessary clerical assistance. The Forest Service will headquarter a forester with the Survey Staff. The Economic Research Service will have one full-time agricultural economist and one half-time economic assistant.

PROGRESS REPORTS

A progress report will be made monthly by the River Basin Staff Leader to the Chairman of the Field Advisory Committee with copies to other members of the Field Advisory Committee. It shall contain information on public contacts, inter-agency cooperation, problems, progress since previous report, schedule for next month, fiscal status, and other pertinent matters.

At the end of each quarter of the fiscal year, a quarterly report will be submitted by the River Basin Survey Staff to the Field Advisory Committee. This report shall be similar in format to the monthly report and will replace it for that month.

The Field Advisory Committee will make any changes or additions to the quarterly report it feels necessary, and then send copies of it to the Washington Advisory Committee through SCS channels.

The local interests should arrange to keep the Field Advisory Committee informed as to the activities they are carrying out.

Special reports may be required from the Survey Staff from time to time, as needed.

SCHEDULE OF PLANNED ACTIVITIES

USDA Field Advisory Committee

Meeting of the Field Advisory Committee will be held quarterly, or as called by the Chairman on a need basis. Minutes of these meetings will be distributed to members of the Committee, the Survey Staff, and three copies to the Washington Advisory Committee.

Consideration should be given to holding meetings of the Field Advisory Committee just prior to meetings called by the District Engineer, Huntington District Corps of Engineers.

Completion of Major Items of Survey

A schedule of activities to be completed is as follows:

July 1 - December 31, 1967

1. Staff the River Basin Survey Party.
2. Prepare and obtain approval of Plan of Work.
3. Develop and obtain approval of Work Outline.
4. Initiate contact with all organizations, groups, and federal and state agencies who will be participating in the Survey.

5. Locate, assemble and review basic data. Much of this data will come from the Ohio River Basin Type I Comprehensive Survey.
6. Prepare base maps and correlate with other agencies.

January 1 - June 30, 1968

1. Delineate sub-watersheds and begin watershed investigations of upstream watersheds.
2. Prepare the report on the agricultural economy.
3. Collect field data on upstream watersheds, engineering, economic, hydrologic, and geologic.
4. Prepare guidelines for project formulation.
5. Develop a PERT network analysis diagram.

July 1 - December 31, 1968

1. Continue investigations of sub-watershed.
2. Appraise the impact of proposed water resource development projects on agricultural and forest resources and on the rural economy of the basin.
3. Analyze and evaluate data collected.
4. Prepare economic base projections of sub-areas.

January 1 - June 30, 1969

1. Continue with field surveys and investigations.
2. Prepare cost estimates, hydrologic and economic evaluations of structural and land treatment measures and combination of measures.
3. Determine the downstream effects from the upstream projects.
4. Begin project formulation for basin.
5. Complete first draft of USDA Report.

July 1 - December 31, 1969

1. Complete watershed investigations of sub-watershed.
2. Summarize data necessary for plan formulation.
3. Participate with other federal and state agencies in the formulation of a Comprehensive Plan.
4. USDA review and revisions of report.

January 1 - June 30, 1970

1. Submit first draft of report of Muskingum River Study - January 1970.
2. Complete the final USDA River Basin Report.
Prepared by: USDA Field Advisory Committee

Raymond S. Brown, Chairman
Soil Conservation Service

Roger Strohbehn
Economic Research Service

Robert R. Lindahl
Forest Service

(Date)

(Date)

(Date)

The undersigned concurs in the above USDA Plan of Work for the
Muskingum River Basin, Ohio.

Ohio Department of Natural Resources

By: _____

THE UNIVERSITY OF CHICAGO

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